

The role of stress and life events in the onset of depression in the elderly

O papel do estresse e de acontecimentos cotidianos no desenvolvimento da depressão na terceira idade

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ABSTRACT: The prevalence of major depressive episode in the elderly leads to impairment on several aspects of daily life, including life quality, morbid - mortality and increases rates of suicide risks. Stress and life events are frequent triggers of depressive episode in elderly. The present review aimed to explore the aspects related to the onset of depression in old age, focusing on psychosocial and stress. In order to achieve that, we systematically reviewed papers published in the Medline database from 2003-2013. From this study, we verify that depression in the elderly is a complex disorder, more often associated to psychosocial aspects and chronic stress than to genetic and biomarkers. Loneliness, daily and chronic stress, lack of social support, mourning and economical aspects such as retirement and job loss are major risk factors for depression. Generally, negative life events were noticed to cause poorer mental health in advanced age and cumulative stressful events or traumas untreated too. Furthermore, cognitive functions may be affected negatively by lifelong chronic stressors. These events can cause quite a few different impacts in distinct cultures and lifestyles. The consequences also depend on the duration, or on the life period that these episodes occur. The treatment of depression in the elderly should target both medication and psychotherapy in order to account for psychological aspects, especially treatments based on life review. These perspectives are important due to the possibility of development of specific target strategies in order to prevent those risk factors and improve quality of life in elderly. Many points were contradictorily related, overdue the papers had noticed different conclusions about the same studied points. Face of this, we grouped relevant articles with the same results. Notwithstanding, there were points that require more studies, considering the relevance of the theme.

KEYWORDS: Stress, psychological; Life change events; Depression; Aged; Aging/psychology; Quality of life/psychology.

RESUMO: A prevalência de episódios de depressão em idosos leva a prejuízos em vários aspectos da vida diária, incluindo qualidade de vida, morbimortalidade e, também aumento da taxa de suicídio. O estresse e eventos cotidiano são, frequentemente, gatilhos para a depressão que se afloram na idade avançada. A revisão que se segue objetivou explorar os aspectos relacionados ao início da depressão na terceira idade, com foco psicossocial e no estresse. Para tanto, nós sistematicamente revisamos artigos publicados na base de dados Medline (2003-2013). A partir disso, verificou-se que a depressão nos idosos é um distúrbio complexo que está associado mais prevalentemente a aspectos psicossociais e ao estresse crônico do que a características genéticas e biomarcadores. Solidão, estresse diário e crônico ao longo da vida, falta de apoio social, luto e aspectos econômicos, tais como aposentadoria e perda de emprego, são os principais riscos para se desenvolver sintomas depressivos. Ademais, acontecimentos considerados negativos, eventos estressantes que se acumularam ou traumas não tratados durante a vida foram relacionados à piora da saúde mental na idade avançada. Tais eventos podem causar diferentes impactos em culturas e estilos de vida distintos. As consequências também dependem da duração ou do período da vida em que os episódios ocorreram. O tratamento da depressão no idoso deve ser baseado em medicações e psicoterapia, a fim de tratar aspectos psicológicos. Nesse sentido, destaca-se a terapia com base na revisão e análise de vida. Estas perspectivas de tratamento são importantes devido a possibilidade de desenvolver estratégias alvo específicas, a fim de prevenir esses fatores de risco e melhorar a qualidade de vida do idoso. Muitos pontos foram contraditoriamente relacionados, ou seja, artigos que estudaram os mesmos fatores divergiram nas conclusões. Diante disso, nós agrupamos os artigos mais relevantes com convergência de conclusões. Não obstante, há assuntos que necessitam de mais estudos, considerando a relevância do tema.

DESCRIPTORES: Estresse psicológico; Acontecimentos que mudam a vida; Depressão; Idoso; Envelhecimento/psicologia; Qualidade de vida/psicologia.

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INTRODUCTION

The elderly population is growing worldwide. According to the World Health Organization (WHO), in 2050, the number of people aged 60 years and over is expected to increase from 605 million (in 2000) to incredible 2 billion people¹. The elderly will respond to 22% of world population, including almost 400 million people aged 80 years or older by 2050¹. The prevalence of major depressive episode in the elderly is about 10,3%², and it leads to impairment on several aspects of daily life, including life quality, morbid - mortality and increases rates of suicide risks³⁻⁶. Taking all these information into account, depression in the elderly is a major problem in the health system.

It is necessary to differentiate the elderly subject that present a first episode in the youth and a recurrence of the depressive disorder in old age, to those who present the first episode in late life. The onset of depression in old age is more often associated to the presence and influence of stressful psychosocial factors, like chronic distress, anxiety, marital status, bereavement, illness, job, economic conditions and gallery life events that marked transitions in routine and producing emotional impacts. Face of these facts, stress and life events like a trigger of major depression in elderly is an important theme that must be further studied and researched in order to better comprehend causes, consequences and treatments for this prevalent illness.

The present review aimed to explore the aspects related to the onset of depression in old age, focusing on psychosocial and stress. In order to achieve that, we systematically reviewed papers published in the Medline database, selecting those pertinent to the theme and describing in categories presented hereafter.

Search strategy and selection criteria

Firstly, we carried out meticulous research into the Medline database - The National Research Register, using the following medical subject heading terms: life events, depression and ageing. We also filtered our results with a limit of up 10 years (2003-2013). The strategy described lead to acquire a total of 202 papers. The flow chart 1 resumes the selection process of the papers reviewed here.

Inclusion criteria

The criteria used for this selection was based in stress and life events as a trigger of onset depression in elderly. Initially, we selected the relevant papers by reading the title and excluding those that were not directly related to this review or written in a non-English language. If the title were pertinent for the theme, we included the article for posterior analysis. Subsequently, we screened independently the abstracts and selected potentially relevant articles. This

preliminary scan resulted in 84 papers selected by I.M and 116 by G. G. Thereafter, 71 studies were selected by both authors, notwithstanding, 57, due to discordant points of view. An agreement meeting among all authors (I.M., G.G. and T.A.) resulted in a total of 99 potential papers for posterior reading. Nonetheless, using the Open Access Medline, VPN USP and Capes periodic, we can only download 49 original studies in a total of 78 and also 11 reviews were obtained of 18 possible. The flow chart below resumes the selection process and retrieving articles.

The next step was to study the original articles compiled and set up a table with the following topics: author and data; sample characteristics, study design and methodology, results and relevant observations. Thus, we could organize reports for connecting the results for thematic analysis. Finally we extracted the main categories and subthemes based on the main findings of the selected papers. Those categories were discussed in details.

Depression in the elderly: clinical features and biological aspects

Several studies show that prevalence of late onset depression increases with age^{3,7} including both elder (octogenarians) and more elder (centenarians) individuals⁸. Early diagnostic is very important in order to ensure late quality life^{2,9-11}. Unfortunately many elderly individuals that present depression are under diagnosis¹². More often than not, the general physician tend to “understand” depressive symptomatology as normal part of ageing process¹¹. Complaints about weakness, sleeping problems, eating habits and loneliness are often interpreted as usual and expected from an elderly individual. Other important and extensive part is the suicide extent. Suicide ideation is frequently associated with mood disorders and depressive advanced symptomatology. Britton et al.⁵ revealed that reasons for living are deeply interconnected with possible suicide ideation. In other representative study, Glaesmer et al.⁶ emphasize that people with suicide ideation had a higher number of traumatic events and, normally, Posttraumatic Stress Disorders than subjects without suicide ideation.

The onset of depression in the elderly is multifactorial and associated to a lesser part of genetic involvement. Some studies discussed in our review approach on genetic and biomolecular analysis. However, most of them, show negative results on the genes studied, noticing us little relevance of genetic component to determinate depressive symptomatology. For example, Hoen et al.¹³ did not observed an association between depressive disorders and leukocyte telomere length, after two years of follow-up the sample. Ritchie et al.¹⁴ in accordance to Power et al.¹⁵ did not observe an association between adverse childhood and 5-HTTLPR genotype with late-life depression. Furthermore, no association were established with the MTHFR C677T

gene and the modulation of mood and cognitive performance in late life¹⁶

Treatment of depression in the elderly can be done with pharmacotherapy (antidepressants) and/or psychotherapy. The use of antidepressant in the elderly might be done with caution due to potential problematic side effects of many antidepressants such as tricyclic drugs. With the development of newer and effective antidepressants the use in the elderly subjects become easier and safer¹⁷. The gold rule of treatment of an elderly individual with a medication is “start slow, go slow but go”. Some Selective Serotonin Reuptaker Inhibitor (SSRI) present interesting

medication to be used in the elderly due to low drug interaction and few side effects (Citalopran, Escitalopran and Sertraline). Fluoxetine has an disadvantage of long term half-life and more potential drug interaction due to its effect over citocrome p450. Paroxetine as well has the same potential side effects. Another group that has a good potential to be used in the elderly are the double Noradrenaline and Serotonine Reuptaker Inihibitor (Venlafaxine, Mirtazapine, Duloxetine, Desvenlafaxine). Those medication have all low potential drug interaction and a low time half-life. The only disadvantage is the noradrenergic effect of potential increase in blood pressure that needs to be taken in account.

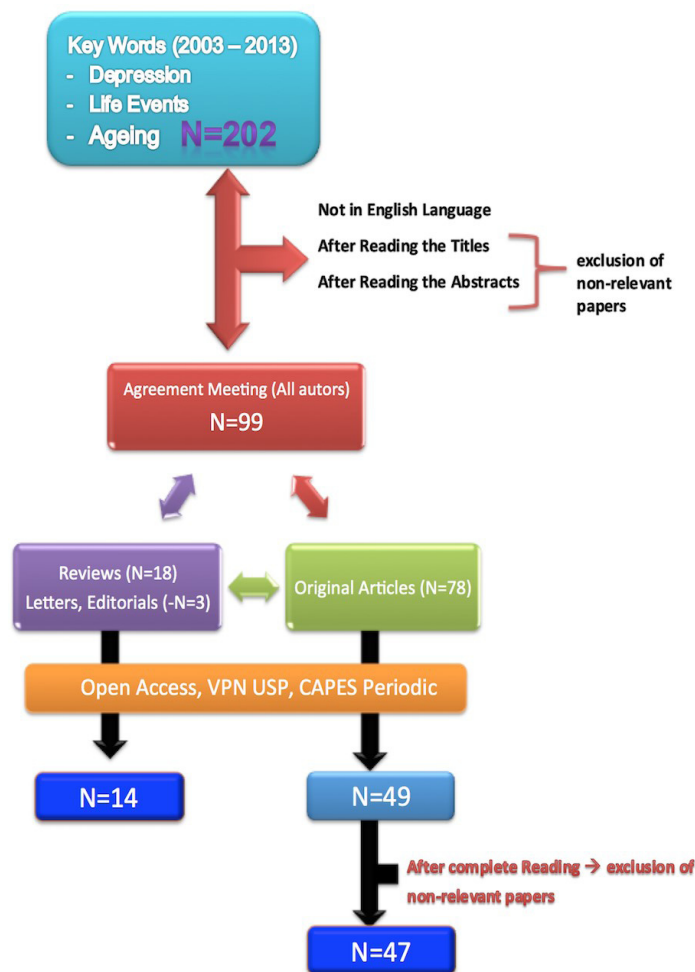


Figure 1 - Flow chart - Articles selection process

However, treating depression in the elderly only with medication will not take in account for the several psychological aspects involved in the onset of the episode. Successful rehabilitation involves several non-pharmacological approaches that are reviewed in the paragraphs below. Depression caused to stressful events treatment in elderly without medicines has shown successful

when it is based in changes in daily life activities, life-review based treatments, and psychological accompaniment with specific psychotherapy. Helping and encouraging patients to solve the problems faced in past or present events could be an interesting strategy for psychological accompaniment^{9,12}.

Studies have strongly suggested that higher levels of

social activity was associated with decreased risk of onset depression incident in elderly¹⁸⁻²². This social activities could include, for example, visiting friends, going to restaurants, sporting events, group meeting church and playing games^{9,23,24}. A strong sense of meaning in life helps older adults cope more effectively with the effects of lifetime trauma James et al.²⁵, concluded in the study that the risk of developing mental disabilities decreases by 43% for each additional unit of social activity in older adults, and it was reported that women had higher levels of social activity than men in elderly.

About treatments established a life review, it is an intervention that promotes activities with specificity of autobiographical memories. Many authors deduced that life review is an strategy suggestion that has revealed

significant changes from pre to post treatment or follow up for depression^{26,27}. Increasing in well-being and decreasing in obsessive reminiscence were watched over among participants of this kind of treatment²⁸. However, it is not in all cases that life review had related positively. For some patients of Hanaoka et al.²⁸ this therapy have either not changed depression symptoms or intensified the case immediately after the intervention, because of the difficult to face past traumatic events. Even though with this initial worsening of the depressive symptoms the author confirmed that in long term this approach was benefic for the patients. This evidence may propose this specific type of life-review therapy could be important only with a long process of treatment, observing improvement in well-being after a complete stage of treatment.

Table 1 - More relevant themes and subthemes in depression in the elderly

Theme	Subtheme	Observation	
	Life events	Lifetime cumulative adversity → vulnerable to depression ³⁰	
		Meaning in life → better coping with traumatic events ⁶³	
		Depressive symptoms increase with age and negative life events ⁶⁴	
		Depression increase with age and familiar troubles ⁷	
	Negative life events	Poorer mental health ⁴ ↑ risk for depression ³⁴	
	Positive life events	Changes in stress and positive life events → changes in depression ³⁶ ↑ risk for major depression ³⁴	
	Daily stress	Differentiate experiencing and reacting to daily stress ⁴⁰	
	Self-oriented/ other-oriented	↑ loneliness and depressive symptoms in second half of life ⁴² Related frailty to increase risk ³²	
	Psychological distress	Traumatic events	Childhood traumas → influences in late life mental health ²⁵
			Political violence → increase anxiety and poor mental health. (Brandon A., 2012)
Sexual or physical assault → all forms of psychopathology ³⁸			
Early life experiences		Childhood traumas increase risk for depression ⁴³	
		Possible positive effect due to learning from experience ⁴ Earlier stress assessed → risks for major depression ³⁴	
Chronic stressors		Associated with emotional discharge → depression ³³	
		Stressful events → decrease cognitive functions ⁴⁷ .	
Cognitive function		Cognitive schemes → Late-onset psychosis ³¹ Cumulative experience, stressful events take a significant pshysiological tool on multiple interrelated systems of the body ³⁵	
Loneliness	Loneliness → changes in depression ⁵⁴		
Suicide ideation	Mood disorder → Increase risks of suicide ideation ⁵ ↑ Number of traumatic experiences and prevalence of Posttraumatic Stress Disorder ⁶		

[CONTINUE]

Table 1 - More relevant themes and subthemes in depression in the elderly [Continuation]

Theme	Subtheme	Observation
Marital Status	Widowhood	↑ isolation, challenges to self-management and increase need for support New illness in the early bereavement period ⁵⁷
		First year and a half of widowhood → mental and physical healthy declines ⁵⁵
	Life review	Later life circumstances, marital disruption (divorce and widowhood) → depression ⁴¹ Singlehood is not ⁴¹
		↑ risk for depression ³⁴ Reduction depressive symptoms ²⁶
Treatments	Social Support	Contradictory → Difficulties to face the past ²⁸ ↑ well-being post-treatment ²⁷
		Higher levels of social activity → decrease risks ²⁵ Play an important role identifying, preventing and collaborating in the treatment of depressive illness ⁶⁷
		Poor social support → Depression ⁶⁸ Great social-rated health → protected factor ⁶² Social network protect from depression ⁶⁹ High mastery (professional qualification) – Protected against loss events ³⁷
	Professional formation	Higher education → protective factor ⁶⁵ Low level of education → Depression ⁶⁸ Education protect from depression ⁶⁹
		Leukocyte Telomere Length
	Genetic analysis	5-HTTLPR gene
MTHFR C677T gene		Does not play an important role in the modulation of mood and cognitive performance in late life ¹⁶
Retirement Spouses's		Marital Context plays an important role in retirement well-being ⁶⁰
Socio-economic conditionals	Job loss	1 job loss → increase 10,5% in depressive symptoms ⁵⁹ 2 job losses → 7,4% increases ⁵⁹ 3,4 → decline of 13,8% ⁵⁹
	Conceptualization	Ethnic differences in the conceptualization of depression ³ Illicit drug user, low positive affect or has a low locus of control → Depression ⁶⁸
Others	Risk factors	Metabolic syndrome, Sleep disturbance, visual or hearing impairment, negative life events → Depression Insomnia → strongest association with depressive symptoms ⁶²
	Protective Factors	Drinking alcohol, better social support, more daily walking, higher education → protective factors ⁶⁵
	Intellectual disabilities	Depression ↔ Anxiety ⁶⁶ Chronic diseases ↔ Depression ⁶⁶

Psychological distress

Psychological distress may be manifested in multiple ways and at different levels of severity. But, in general terms, it is experienced like psychological discomfort: sadness, anxiety, distraction and psychotic

symptoms in severe levels. It is a sense of discomfort and felling unsettles and usually at a level which is getting in the way of activities of daily living. Many kinds of life events can cause psychological distress, like severe stressors, everyday stressors, medical illness or mental illness²⁹.

Table 1 report the main findings of psychological distress as predisposition to depression in the elderly

There is a consensus regarding psychological distress and negative life events occurring in the elderly are important risk factors to development of depression^{2,30-35}. The most consistent finding in this theme (psychological distress) was that life chronic stressors were mostly associated with major depression in late life and mental frailty³³. On the other hand, positive life events like the birth of a child or a personal achievement may be associated positively or negatively with the presence and severity of depressive symptoms, subordinate to stress levels that these events incite^{36,37}. Moreover, changes in daily life might also influence on the course of the depressive episode³⁶.

There is a possible difference in the impact of psychological stressor accordingly to the life period when it occurs. Many authors reviewed here proposed the association between psychological distress in late life and major depression episode in late life^{30-34,36,38-41}. In the other hand, when those events occur earlier in life there were controversial findings. Whereas, Kasen et al., among other authors^{34,42-45}, suggested that early life psychological distress might lead to an increase risk of depression in old age; Shirira et al.^{4,30} proposed the opposite, that adversity in early life when not directly orientated to the individual could result in a positive effect on mental health in late life.

The comparison between the prevalence of psychological distress and onset of depression is difficult to be analyzed among different studies due to the variety of different assessments instruments, the cut-points applied to dichotomize the score of distress (tenseness) and also of the time windows used in the documentation of symptoms. It nearly ranges between 5% and 27% in the general population, but it can reach higher levels in some segments of the population exposed to specific risk factors²⁹. Therefore, psychological distress is a subject which raises concernment in current technological community, that toils increasingly with stressful daily life events.

Another aspect that requires a better evaluation is the time-gap between being subject of psychological distress and the personal reactivity facing the same distress. Facing this fact, some studies revealed that different effects of stress situations were stated in different people. Alexandrino-Silva et al.²³, discussed differences between genders; males and females might have different predictors to onset depression. Lawrence et al.³, in other evidence, in a multicultural study, analyzed that concepts and causation of major depression could suffer variety among different cultures and ethnicities. These pointed facts should gain attention to treat each depression case in elderly.

Several authors^{31,33,46,47} reported a correlation between psychosocial aspects of late onset depression and cognition. In other terms, life experiences cognitive behavioral patterns and attitudes to ageing have important psychosocial

correlates of late-onset depression symptomatology. For Stawski. et al.⁴⁷, cognitive process related to stress is an important predictor of reductions in cognitive function in advanced age, particularly with respect to reduction in memory performance. Even though previous reports of ageing process influence over mental flexibility suggested a correlation, Bailly et al.⁴⁸ could not confirm this data. The authors accessed data regarding coping mechanisms to negative life events and suggest that there are two possible coping mechanisms, that are do either a problem-focused coping or an emotion-focused coping. And also, in face of these difficulties, either the person adjust himself leading to an accommodation process (mental flexibility) or can made it a learning situation and help improving self-esteem as long as there is a realistic chance of achieving her/his goal (mental tenacious).

Eventually, psychosocial distress might also lead to biological changes in both *Hypothalamic-pituitary-adrenal axis* (HPA) axis and brain structures^{43,44,49}. In the HPA axis, the presence of chronic psychological distress can activate the adrenergic answer to stress³⁵ and influence the behavior learning conditioning. Behavioral cognitive therapy proposed that negative thinking and negative memories might predispose to depressive symptomatology. Regarding to brain structures, chronic stress has been associated to changes in brain areas that are important to mood regulation, such as hippocampus, limbic and prefrontal cortices⁴⁴.

Child and early adult life experience: education, formative years and traumas

Lifetime cumulative adversity may have an impact in depressive symptomatology and quality of life in older adults; it was noticed that people with more lifetime cumulative adversity were at greater risk of high level of depressive symptoms and low level of quality of life^{4,30}. These traumatic events include experiences in childhood, like divorce of parents, war, being forced to leave a familiar environment or a sexual abuse^{14,34,41}. Many authors concluded that certain types of childhood traumas might constitute risk factors for the onset of depression in late life^{4,14,25,34,41,50}. Several factors might influence on the impact of childhood life events, such as level of education, culture, and parental care, which contributed for the formation of child identity^{14,25,51}.

The future effect of life events in early life is controversial and might be influenced by many factors, including if the life event was self- or other-orientated potentially traumatic event. There are conflicted data regarding this point^{4,30,42}. Palgi et al.⁴², discussed that self-oriented and other- oriented potential lifetime traumatic events reported to have occurred early in life are associated with perceived loneliness and depressive symptoms in second half of life. Whereas, Shmotkin

et al.⁵² partially confirmed the hypothesis which asserts self-oriented adversity have a positive association with depressive symptoms, other-oriented adversity have either no association or an inverse association with depressive symptoms^{52,53}. Ritchie et al.¹⁴, concluded that exposed to traumatic events in childhood double the risk of late life depression and increase risk of repeated crisis episodes. After that, the study related significant risks associate with excessive parental problems, poverty impediments and mental disorder in parents¹⁴.

Even though it is not a consensus, it is possible that childhood life events, especially if other-oriented and non-traumatic, may be related positively for the child formation, when the events could learn experiences carried into adulthood^{14,25,42}. It's not clear yet, whether stressful life events lead to increased risk of depression in late life or are associated to learning and protection in adulthood. Probably, individual and environment aspects play important roles, as well as family and social support to help the child deal with situation. As it is not possible to infer the future direction of the effect of life events in early phases, we might increase the odds to a positive outcome, by offering social and psychological support to those child and young adults that undergo to a stressful life event that occur to him/herself or to a third part.

Loneliness, marital status and late life changes

Life events that involve abruptly changes in marital status ordinarily reflect on suddenly changes in the way of life. New routine, new possibilities of life must be faced, for example, dealing with grief caused by family conditions, widowhood, loneliness and bereavement in general. These situations are considerate relevant factors that can cause depression symptomatology in elderly people. Mainly, elderly that had being neglected and subject to face grief without family support are more vulnerable to develop both depression and physical frailty^{23,54-58}.

Many longitudinal studies suggested a high prevalence of depression in the elderly subjected to grief and loneliness. Utz et al.⁵⁵ concluded that there were considerable somatic symptoms during the earliest months of bereavement and those with poor mental or physical health at the time of widowhood had significantly higher risks to develop depression symptoms. About loneliness, authors reveled this life situation like a significant predictor of depressive scenes mainly when the person was used to live with a family and friends^{42,54,57} and, in advanced cases, suicide ideation, topic exposed by Britton et al.⁵. Social support default associated with loneliness causing depressive symptoms was also investigated by Alexandrino-Silva et al.²³, in a Brazilian study, with subjects aged 60 years and older or greater with associated factors. The authors showed that the depressive symptomatology occurred in 18,8% of the patients in tested sample and this fact is associated with

living alone and with a perceived lack of social support²³. Social support and life events are determined to be associated with late-life major depression and loneliness is influenced by less social support. Furthermore, this study reveals a subtle difference between genders: life events may be more associated in female cases and lack of social support in male patients²³.

Even though many authors implicated loneliness and grief to the onset of depression^{23,54-58} this topic is yet to be a consensus among investigators. Kamiya et al.⁴¹ studied 8,504 individuals and concluded that loneliness could not be fully implicated in the onset of depression. The authors differentiate those once married to those that were used to leave alone. They observed that marital disruption (either divorce or widowhood) was associated with the onset of depression in the elderly, however, when it comes to singlehood, this direct relationship could not be verified[41]. It is possible that elderlies subjects that were single have developed a social support network in friends and family, whereas those who were once married probably have a more dependable relationship.

Some articles treat about economic situation and professional achievement as influences or causes of depressive disorders; in other words, professional dissatisfaction and life events involving loss and low mastery could be an important and decisive point to increase the risks of developing depressive symptomatology in elderly. The loss of employment is a strong risk factor for depression in the elderly^{59,60}. Gallo et al.⁵⁹ observed that one job loss was associated with a 10.5% increase risk for depressive symptoms, whereas two job losses suggested a 7.4% increase. It is interesting that 3 or 4 job losses lead to a decline of 13.8% due to learning process.

Even in the retirement period, life experiences during the professional career can be reflected. If the person were not satisfied with the professional life, defeat feelings may surface in the retirement period; the person may lose the interest of daily activities and enhance the chance of accumulation of depressive symptoms^{31,37,60,61}. Beurs et al.³⁷ proposed that high mastery protects against the negative impacts of loss events, but neuroticism did not augment the negative impact of threat events on emotional health. Specifically about retirement, this life period, normally, marks a huge change in all spheres of life.

CONCLUSION

Depression in the elderly is a complex disorder, more often associated to psychosocial aspects and chronic stress than to a genetic component, for instance. Chronic depression has both physical and mental consequences that may complicate an older adult's existing health condition and trigger new concerns. There are evidences that some natural body changes associated with aging may increase risk of developing depression.

Meanwhile, other risk factors can be avoided to promote more quality of life in elderly. These aspects are important due to the possibility of development of specific target strategies in order to prevent those risk factors. An early diagnosis may be performed by analyzing these risks and associated factors, favoring the selected treatment.

We are in a tipping-point moment: the elderly population is steadily growing worldwide as we increase the life expectancy. Hence, we need to seek for solutions to prevent and treat the massive problem of elderly depression, bringing less health suffering and foster well-being in advanced age.

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